

# LIGHT ASSEMBLY, ESPECIALLY SIGNAL LIGHT, FOR MOTOR VEHICLES

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

5           The invention relates to a light assembly, especially a signal light, such as a taillight, for motor vehicles, wherein the light assembly comprises a housing whose housing opening is covered by a lens and in which housing at least one reflector as well as at least one light source are arranged.

### 2. Description of the Related Art

10           Taillights of motor vehicles are known which have a tubular fluorescent lamp used as a light source arranged in the housing of the light assembly. Such a fluorescent lamp is expensive and has a relatively short service life.

## SUMMARY OF THE INVENTION

15           It is an object of the present invention to configure a light assembly of the aforementioned kind such that it can be manufactured inexpensively while providing a long service life.

20           In accordance with the present invention, this is achieved in that at least one LED is provided as a light source which is arranged in the housing so as to be hidden wherein the rays of the LED are reflected partially by a reflector to at least one light guide which is positioned in the area between the reflector and the lens.

The light assembly according to the invention has a light source in the form of at least one LED which has a long service life and can be produced inexpensively. The light guide provides the impression that a tubular fluorescent lamp is arranged within the light assembly. The light guide is however significantly less expensive than a tubular fluorescent lamp. The light assembly according to the invention can be used for all types of signal lights, for example, turn signal lights which are positioned in the forward area of the motor vehicle.

#### BRIEF DESCRIPTION OF THE DRAWING

In the drawing:

Fig. 1 shows a vertical section of a part of a light assembly according to the invention for a motor vehicle; and

Fig. 2 is a view of the taillight without lens.

#### DESCRIPTION OF THE PREFERRED EMBODIMENTS

The taillight 1 illustrated in the drawings has a housing 2 which is illustrated only partially in Fig. 1. The housing opening 3 is covered by a lens 4, as is known in the art. Inside the housing 2, a reflector 5 is provided at a spacing behind the lens 4. The reflector 5 is formed as a monolithic part of the housing 2 in the illustrated embodiment; however, it can also be a separate component. Behind a housing wall 6 adjoining the reflector 5 a printed circuit board 7 is arranged. Preferably, several LEDs 8 are arranged sequentially in a row behind one another on the board 7. However, only one LED 8 is illustrated in Fig. 1.

Preferably, the LEDs 8 are SMD (surface mounted device) LEDs. The housing wall 6 adjoining the reflector 5 is surrounded at a spacing by the outer wall 11 of the housing 1. In this way, a receiving space or receptacle 12 for the printed circuit board 7 is formed between the two housing walls 6 and 11. Because of this arrangement, the printed circuit board 7 is no longer visible from the exterior. The LEDs 8 are positioned in openings 13 in the housing wall 6 and preferably do not project past the housing wall 6 in the direction toward the reflector 5. The light emitted by the LEDs 8 is reflected on the reflector 5 in the direction toward the lens 4, as indicated by the rays in Fig. 1. As a result of their hidden arrangement in the housing wall 6, the LEDs 8 are not visible through the lens 4 from the exterior.

In the area between the reflector 5 and the lens 4, a light guide 9 is arranged which has a smaller spacing from the reflector 5 than from the lens 4 in the illustrated embodiment. However, the light guide 9 can also be positioned at the same spacing relative to the reflector 5 and the lens 4 or it can have a greater spacing from the reflector 5 than from the lens 4. The light guide 9 is rod-shaped and is comprised of PMMA (poly methyl methacrylate). It extends advantageously substantially over the entire length of the reflector 5. As shown in Fig. 2, the light guide 9 is curved across its length. Of course, the light guide 9, depending on the configuration of the light assembly 1, can have any other suitable shape. It is secured with both ends in a suitable way.

The back side 16 of the light guide 9 facing the reflector 5 is straight when

viewing the light guide 9 in cross-section (Fig. 1); however, it can also be curved in cross-section. The front side 17 of the light guide 9 facing the lens 4 is convexly curved. The light guide 9 has only such a width that a portion of the light rays 10 emitted by the LEDs 8, after having been reflected on the reflector 5, pass the light guide 9 and directly impinge on the lens 4.

Another portion of the light rays 10 emitted by the LEDs 8 are reflected on the reflector 5 and impinge on the back side 16 of the light guide 9, pass through the light guide 9, and then impinge on the lens 4. Since the light guide 9 is rod-shaped and the rays, upon passing through the light guide 9, obtain a different color hue, a person looking onto the light assembly 1 from the exterior will see a band-shaped or rod-shaped light area. The person has the impression that a tubular fluorescent lamp is provided behind the lens 4. In order to enhance this impression, it is possible to introduce light into one end or both ends of the light guide 9. For this purpose, at one end and/or the other end of the light guide 9, a light source, preferably an LED, is arranged whose rays pass through the light guide 9. The front and/or back sides 16, 17 of the light guide 9 can be provided with optical elements such as lenses, profilings, or the like.

The LEDs 8 and the light guide 9 of the described light assembly 1 are suitable as a replacement for conventional expensive tubular fluorescent lamps. In this way, the light assembly 1 can be produced inexpensively and simply. The light assembly 1, as a result of the use of LEDs, has a long service life. Finally, the light

assembly 1 is suitable for all kinds of signal lights such as, for example, front turn signal lights of passenger cars.

While specific embodiments of the invention have been shown and described in detail to illustrate the inventive principles, it will be understood that the invention  
5 may be embodied otherwise without departing from such principles.